

DESCRIPTIONS OF NEW SPECIES OF NORTH AMERICAN MAMMALS  
WITH REMARKS ON SPECIES OF THE GENUS *PEROGNATHUS*.

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The pocket mouse from Texas here described as new was obtained during the past year by Prof. E. D. Cope and placed in the collection of the Academy of Natural Sciences of Philadelphia.

The specimens of *Perognathus lordi* on which I have based the duplicate description of that species, so imperfectly characterized by Gray, were taken during a collecting trip in Washington and British Columbia last year, and are included in the author's private collection at the Academy.

By the rediscovery of *P. lordi* of Gray I am enabled to throw some light on certain questions of synonymy propounded by Dr. Merriam in his monographic revision of the genus.<sup>1</sup>

The figure of skull of *P. femoralis* here given completes the illustrations of known species of the genus.

1. *Perognathus copei*, sp. nov. (type No. 1612, ad. ♂, Col. Acad. Nat. Sci., Phila., Staked Plains near Mobeetie, Texas, August 26th, 1893; col. by Prof. E. D. Cope).

Description.—Size small, somewhat greater than Baird's measurements of *P. flavus*. Colors similar to Baird's description of *P. monticola* but smaller. Ears destroyed. Tail thickly covered with coarse hairs, concealing the annuli; grayish white above, pure white below, with terminal pencil, slightly crested-penicillate.

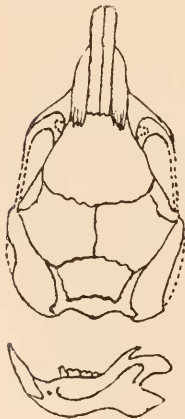


Fig. 1.<sup>2</sup>

Beneath, including whisker patch and feet, white. Upper back and head grizzled blackish fawn, the black tips coarsely predominating. Rump and thighs strongly washed with cinnamon, this color forming a broad posterior band diminishing laterally to a faint line at fore-legs; soles nearly naked, heel clothed with bristly hairs half way to toes, as in *flavus*; skull similar to *flavus* but longer and narrower, the mastoids less pronounced both laterally and posteriorly, the interparietal a squarish pen-

<sup>1</sup> N. Amer. Fauna, No. 1, 1889.

<sup>2</sup> All figures twice natural size.

tagonal as in *P. inornatus*. In *flavus* the coronoid process is short and blunt, in *copei* it is long and sharply attenuate. The condyle in *copei* extends far beyond the tip of angle and its upper line is horizontal, instead of oblique, as in *flavus*. In the latter the ratio of length to breadth of interparietal is 78, in *copei* it is 62.

*P. copei* belongs to the *fasciatus* group of the sub-genus *Perognathus*.

Measurements.<sup>3</sup>—Total length, 114; tail, 49; hind foot, 15. Skull, total length, 19.5; basilar length of Hensel, 14.5; greatest mastoid breadth, 10; length of nasals, 7; interorbital constriction, 4.5; length of mandible, 9.7; height of coronoid process from angle, 4.2; ratio of length to breadth of interparietal, 62.

Remarks.—Dr. Merriam thinks the specimen from Mason, Texas, on which he bases his description and figure of *flavus* in N. Amer. Fauna, No. 1, may possibly not prove typical. In any case it is evident that *copei* is in no sense identical with it, either cranially or externally. So far as can be determined from Baird's description of *flavus* there is nothing to prove its dissimilarity to the Mason specimen, whereas *copei* shows essential differences from either; first in color, second in color-pattern, third in hairiness of the tail.

Baird did not define or figure any cranial characters. The specimen of *copei* was taken by its discoverer from the stomach of a rattlesnake captured by him on the eastern slope of the Staked Plains near the headwaters of the North Fork of the Red River, in Wheeler County, Texas. Owing to its passage through the snake the specimen is probably abnormally long. The skull had been forcibly compressed but not enough to prevent its restoration as seen in the figure.

2. *Perognathus lordi* (Gray). *Abrornys lordi* Gray. Proc. Zool. Soc., London, May, 1868, 202. (Duplicate type, No. 447, ♂; Col. S. N. Rhoads; Vernon, head of Lake Okanagan, British Columbia, July 28, 1892; col. by S. N. R).

Description.—Size medium, pelage soft, full and silky, ears rather small, tail slightly longer than head and body, sparsely and coarsely haired at base, the hairs longer and more silky toward the slightly-crested-penicillate extremity. Above grayish buff, softly grizzled with black, the individual hairs, as described by Gray, being basally "dark lead color with short gray band and minute (slender) black tip." The feet, lower half of tail, chin, throat, chest and belly and a spot on inferior margin and posterior

<sup>3</sup>All measurements in millimetres.

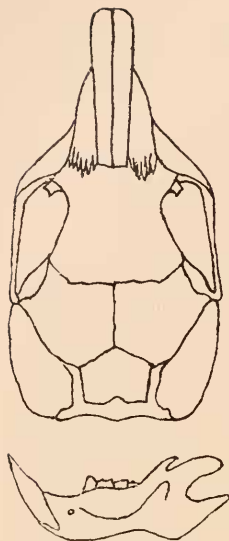


Fig. 2.

base of ear, white. Sides of cheek, neck, belly, thighs and tail washed with pale buff, this color often broadly encroaching upon the pure white of throat and belly. Upper third of tail colored same as back, darkening to black at the tip.

Measurements.—Total length, 179; tail, 92; hind foot, 24; ear, from crown, 4.5. Skull.—Total length, 26; basilar length 17.5 greatest mastoid breadth, 14; length of nasals, 10.7; interorbital constriction, 6.2; length of mandible, 12; height of coronoid process from angle, 5.2. Ratio of mastoid breadth to basilar length, 82; of mastoid breadth to total length, 53.9; of length to breadth of interparietal, 71. Lower premolar larger than the last molar; audital bullae not united by a symphysis but separated by  $\frac{1}{2}$  mm. anteriorly; bullae not projecting beyond plane of occiput.

Remarks.—Eight specimens of this species were trapped on the semi-arid foothills at the head of Lake Okanagan. They abundantly frequented the open hillsides of bunch grass and sage-bush up to timber line and down to near the lake levels, driving their myriad tunnels without difficulty through the dry, indurated and stony soil. Their habits seem to more closely resemble those of *Thomomys* than any other genus of burrowing rodent. Owing to their habit of pushing a load of dirt ahead of them it was difficult to catch them in their retreats but a trap set by the mouth of certain foraging exits was more successful. In the daytime they keep underground, coming forth nightly to replenish their larder with the seeds of weeds and grasses. This species was not found in similar localities farther north. It is probably limited to the southern parts of the Great Basin fauna of British Columbia as defined by me in the Proceedings of the Academy of Natural Sciences of Philadelphia, 1893, page 25, and extends south into Northeastern Washington. It is very doubtful if its habitat reaches farther west than the more arid foothills of the Cascade Mountains; the Selkirk Range would form a natural barrier to its dispersion eastward.

3. *Perognathus femoralis* J. A. Allen.

Dr. Allen described this species in 1891.<sup>4</sup> Its cranial characters never having been figured, I take this opportunity of illustrating them from three specimens taken at the type locality during the past year (1893). *Femoralis* differs from its allies *fallax*, *californicus* and *armatus* in essential cranial peculiarities, as may be seen by a compar-

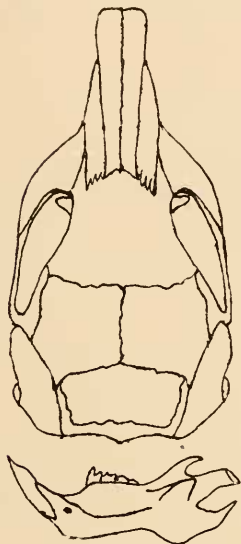


Fig. 3.

parison of the figure with those of Merriam. Its skull is most like that of *californicus*, from which it differs in the square-cornered interparietal, the mastoid and zygomatic breadths being equal and the plane of occiput being on a line with the postero-mastoid angles; the mastoids are relatively larger in *femoralis* and the coronoid process of mandible is longer and sharply hooked. It may be further remarked that the three California species under consideration are a striking illustration of the wonderful fertility of the region they inhabit in the differentiation of species, externally similar, but anatomically distinct. *P. femoralis* probably belongs to the *penicillatus* group of the sub-genus *Chatodipus*, as defined by

Mr. Merriam.

*Notes on the Affinities of Perognathus lordi, P. mollipilosus and Cricetodipus parvus.*—In his admirable Revision of the North American Pocket Mice Dr. Merriam enumerates three species whose identity it was then impossible to determine, viz., the *Abromys lordi* of Gray, the *Perognathus mollipilosus* of Coues and the *Cricetodipus parvus* of Peale. Dr. Merriam, in summing up his conclusions, refers to these as follows: "My opinion is that this animal, (*P. mollipilosus*), will prove to be identical with *P. lordi* and both may be the same as *P. parvus* of Peale." In another place (page 27) he states: "all three come from the Pacific province, from Northern California northward."

Taking the above description of *lordi* as a basis, it remains to be

<sup>4</sup>Bul. Am. Mus. N. H., Vol. 3, No. 2, 281.

decided, (1) whether the British Columbia Pocket Mice taken by me are identical with the type of *lordi*. (2) If so, can they be identical with *mollipilosus*? (3) What is their relationship to *P. monticola* of Baird? (4) Are any of these the same as *Cricetodipus parvus*? (5) To what faunal areas do these species belong?

(1). To the first query I can answer without hesitation in the affirmative. I cannot find the slightest discrepancy between Gray's original description and the specimens from Vernon. This is further confirmed by Mr. Oldfield Thomas's letter quoted by Dr. Merriam in his remarks on *lordi* in American Fauna No. 1.

(2). *Perognathus mollipilosus* differs from *lordi* in the following particulars: *a*, smaller size; *b*, tail one-third longer than head and body; *c*, cinnamon tints; *d*, color of upper parts descending to wrist; *e*, it inhabits a different faunal region. Its only affinities to *lordi*, so far as can be determined from Coues's description, consist in the non-penicillate tail, soft and smooth pelage, white lower parts, pale fulvous lateral stripe and bicolor tail. In *lordi*, however, the tail is slightly crested-penicillate and plainly tricolor, the latter a peculiarity I have not noticed in any other murine rodent.

(3). The characters of *lordi* coincide more closely with those of *P. monticola* of Baird and Merriam than with any other. Mr. Thomas wrote Dr. Merriam, after examining the type of *lordi* in the British Museum, that, "so far as (he could) make out from Coues's description (it) is the same as *P. monticola*."

The description of Coues referred to was made on the supposition that a specimen from Fort Crook, California, was the same as Baird's type which is supposed to have come from St. Mary's Mission, Montana. Dr. Merriam refers to this Fort Crook specimen without hesitation as *mollipilosus*, (Coues's provisional name for it), and says the *P. monticola* of Baird "is a very different animal." We have seen that *lordi* and *mollipilosus* are not synonymous, and Dr. Merriam thinks *mollipilosus* and *monticola* are quite distinct, while Mr. Thomas thinks the type of *lordi* answers Coues's hybrid description of *monticola et mollipilosus*.

As the description of *monticola* has several year's priority over *lordi* the stability of the latter in our nomenclature depends on its specific dissociation from *monticola*. That they are different species I have very little doubt, notwithstanding their apparent resemblance.

As compared with *lordi*, *monticola* may be distinguished by *a*,

smaller size; *b*, cinnamon of upper parts; *c*, cinnamon of sides; *d*, plumbeous bases of belly hairs; *e*, outside of foreleg dusky to wrist; *f*, smaller skull; *g*, mastoids projecting behind plane of occiput; *h*, audital bullae united by an anterior symphysis; *i*, relatively broader interparietal; *j*, shorter and blunter coronoid process; *k*, lower pre-molar smaller than last molar.

(4). Having shown that the evidence is against considering *lordi*, *mollipilosus* and *monticola* synonymous and that their closest affinities are not between *mollipilosus* and *lordi*, as suggested by Dr. Merriam, but between *mollipilosus* and *monticola*, let us consider their relationships to *Cricetodipus parvus*. If Peale's "mouse" can ever be proved to be a *Perognathus* I should predict, on geographical grounds, that it is more likely to be the same as *mollipilosus* than any other of the trio. But there is strong evidence in Peale's minute description that *Cricetodipus parvus* is not a *Perognathus* at all, but a suckling *Perodipus*, or five-toed kangaroo rat.

This evidence may be briefly summed—*a*, Dr. Merriam proves it to be, (Amer. Fauna., p. 3), a "very young" animal; see also Baird, (Mam. N. Amer., p. 425); *b*, "head and body equal;" proportions never (?) seen even in half-grown *Perognathus* but correlated with the proportions of adult *Perodipus*; *c*, "whiskers numerous, white, a tuft of white hairs or bristles on the chin;" this tuft is present in *Perodipus agilis*; I do not detect it in *Perognathus*; *d*, "fore-legs small, feet moderate, \* \* \* hind legs long, the feet large and strong, five-toed;" almost the reverse of this obtains in *Perognathus*, the fore feet in that genus being, as compared with the hind ones, unusually large and powerful; *e*, the very "long hind legs and long tail" are again commented on, "leaving little room to doubt that its habits are similar to those of the jumping mice, *Meriones labradorius*," a comparison not so applicable to a Pocket Mouse as a Kangaroo Rat, in fact not applicable to *Perognathus* at all, so far as I have examined them; *e*, the long tail (1½ times length of head and body) is applicable to both genera; its absence of crest or pencil usually seen in *Perodipus* may have been due to immaturity: the so-called "*Dipodomys heermanni*," of Leconte, from the "Sierra Nevada," does not seem to have had the usual penicillate tail; *f*, "color above, sepia brown, beneath, white, a dark line crosses the cheeks beneath the eyes;" to no specimen or description of *Perognathus* I have seen will this characteristic color combination apply, on

the other hand it is peculiarly diagnostic of *Perodipus* from California and Oregon; *g. C. parvus* came from Oregon; *Perodipus* has also been taken there and in southeastern Washington but I am not aware of any records of *Perognathus* from these States.

If the type of Peale's mysterious rodent, like other priceless and ill-used novelties of the Audubonian period, "cannot be found," to disprove the above interpretation, it cannot be denied that there is much evidence in favor of its being the type of a five-toed Kangaroo Rat instead of a five-toed Pocket Mouse. As such, *Cricetodipus* Peale, 1848, antedates *Perodipus* Fitzinger, 1867.

(5). Dr. Merriam's statement that *lordi*, *mollipilosus* and *C. parvus* all came from the Pacific Province now needs qualification. While this is probably true of the last two, *lordi* should certainly be assigned to a region quite devoid of the faunal peculiarities of the Pacific slope.

Previous to my rediscovery of *lordi* its precise habitat in British Columbia could only be conjectured, and so far as it went Dr. Merriam's supposition that this type came from the West Cascade region was reasonable enough.

From the nature of its chosen habitat at Vernon, and the absence of a similar environment west of the Cascades it is more than probable that the type came from the same region farther south and that the species is essentially a Great Basin form.

The following species of North American mammals have recently been added to the collections of the Academy of Natural Sciences of Philadelphia. They were taken by Mr. R. B. Herron, who is at the present time continuing a collecting trip in California in the interests of the Academy. Other novelties which may be taken by Mr. Herron, as well as a circumstantial account of the entire collections of birds and mammals made by him, will appear in a future number of the Proceedings.

1. *Dipodomys simiolus*,<sup>5</sup> sp. nov. (Type No. 1616, ♀ Col. Acad. Nat. Sciences, Phila.: Agua Caliente, California, Oct. 19, 1893, col. by R. B. Herron).

Description.—Minature of *D. deserti* with very similar colors, color-pattern and proportions. No white terminal pencil, the dark

<sup>5</sup> *Simi* an ape or mimic; *olus* diminutive.

ashy upper fourth of tail extending to tip; a faint streak of brownish-black on under side of middle third of tail disappearing toward either extremity. Soles scarcely darker than white feet. Tail strongly crested-penicillate, the vertebrae one and one-half times as long as head and body. General shade of upper parts slightly darker than in *deserti*, inclining to cinnamon on rump in adults.

Measurements.—Total length, 241; tail vertebrae, 149; pencil, 35; hind foot, 38; ear from crown (dry) 9. Skull—Basilar length, 21·8; mastoid breadth, 24; interorbital constriction, 14·5; length of nasals, 13; length of mandible to base of incisor, 13·8; height of coronoid process from angle, 5·6.

Six specimens were taken, all in the Mohave Desert at Agua Caliente. The average measurements are less than those given above. This species is easily distinguishable from *deserti* by small size, slightly darker coloration and lack of white tip to tail; from *similis* by its lack of black on rump, tail, soles and hind legs.

5. *Dipodomys similis*, sp. nov. (Type No. 1617. ♀ Col. Acad. Nat. Sciences. Phila.; White Water, San Diego Co., California, Oct. 24, 1893, col. by R. B. Herron).

Description.—In size and color pattern almost an exact counterpart of *Perodipus agilis*. Colors similar to *D. simiolus* and *D. deserti* but darker than either and with tail and limbs relatively shorter than the latter. Above light tawny tipped and lined sparingly with blackish, the latter color more pronounced on rump. Posterior surface of thigh to heel, soles, ring around eyes, base of whiskers, top of nose and upper and lower fourths of tail to tip, blackish. The remainder of body white, including small spot above eye, a larger one at posterior base of ears and stripe across thighs. Ears grayish. Tail crested-penicillate.

Measurements.—Total length, 241; tail vertebrae, 143; pencil, 25; hind foot, 38, ear (dry) above crown, 10·5. Skull—basilar length, 22; mastoid breadth, 24·5; interorbital constriction 14; length of nasals, 14; height of coronoid process from angle, 5. Skull similar to that of *simiolus* but with smaller mastoids and wider across ante-orbital processes of maxillary. In *similis* the lower premolar is narrower anteriorly than posteriorly and as long as wide, in *simiolus* it is of equal width on both faces and much wider than long. In *similis* the extremity of angle of mandible is prolonged and acuminate, in *simiolus* it is shorter and rounded at the extremity.



A male and female from White Water on the western side of Mohave Desert represent the species. They are alike in all important respects.

6. *Perognathus alticolus*, sp. nov. (Type No. 1615, ♂, Col. Acad. Nat. Sciences. Phila.; San Bernardino Mts., California, Sept. 22, 1893, col. by R. B. Herron).

Description.—Most similar to *P. apache* and *P. inornatus*, differing cranially, and in larger size from either, less yellow than *apache* and more decidedly lined with black than *inornatus*. Size small, tail equals length of head and body, or longer, slightly crested penicillate. Above yellowish brown heavily but finely lined with blackish. Pelage very soft and full. Bases of hairs above plumbous for three-fourths their length. A tawny lateral stripe from nose to and including upper half of tail. Distal third of tail above becoming blackish. One-fourth of heel end of soles, haired. Lower parts, feet, fore legs and lower edge of ear white to roots of pelage.

Measurements (from dry skin).—Total length, 157; tail vertebrae, 77; pencil, 9; hind foot, 20; ear from crown, 5. Skull—Basilar length, 16; mastoid breadth, 12.5; interorbital constriction, 6; length of nasals, 8.6; length of mandible, 10.5; height of coronoid process, 4.6.

Cranially *alticolus* may be distinguished from both its allies by the well defined separation of audital bullae below. Its lower premolar is similar to that of *inornatus*, but the mastoids of the latter are very much larger than those of *alticolus*. The same may be said of *apache*. *P. alticolus* belongs to the *fasciatus* group of the subgenus *Perognathus*.

Skull figures of this species and the two *Dipodomys* above described will probably appear in the final report of Mr. Herron's collections.